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Content

How can research on patient experience inform hospital design? A case study on improving wayfinding

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Abstract

For patients a hospital visit is a profound experience influenced by their mental and physical state in that moment. Various aspects of the hospital environment play a role in their experience. For most patients communicating about this experience in all its complexity is a difficult task. This difficulty impedes designers' and hospital professionals' insight into patients' perspective on the hospital environment.

For this reason we are investigating how research on patient experience can inform hospital design. In this paper, we explore more specifically (1) how insight into patient experience can foster an empathic and motivated understanding amongst healthcare professionals and designers, (2) what kind of information is needed to achieve this, and (3) how their improved understanding impacts on their problem solving ability. To this end, we report on a case study in collaboration with a general hospital, with which we organised a series of workshops about improving wayfinding.

Bringing together different profiles of designers and healthcare professionals turned out to be an enrichment for all parties involved, even when working within the same organisation. Depending on their profile, participants had different expectations of the format and content of the information presented during the workshop.

Although the workshop was generally evaluated positively, specific attention should be paid to raising realistic expectations about information on patient experience. We found a discrepancy between what research can tell about real patients' experience, what healthcare professionals expect to learn, and what is useful for designers to work with.

Keywords: Hospital design, Information Format, Patient experience, Wayfinding.

Introduction

For patients a hospital visit is an intense experience. Although familiarity with the environment, anxiety, stress level, and physical state can differ significantly, almost no one visits a hospital completely voluntarily. Staff experience the building from a professional angle: it is their daily work environment which they are highly familiar with. These divergent perspectives impact on how both groups consider and navigate the building. This became particularly clear when studying the case of a general hospital where wayfinding appears to be a major issue.

Prior research involving actual patients and volunteers exploring the hospital building, showed that various aspects of the hospital environment play a role in patients' experience of wayfinding (De Valk, 2015; Weustenraad, 2015). For staff it is not always easy to imagine or even be aware of patients' difficulties in navigating the hospital. Most patients find it hard to communicate about their experience in all its complexity (Annemans et al., 2012). This impedes designers' and hospital professionals' insight into patients' perspective on the hospital environment.

The case study on wayfinding we report on in this paper is part of a larger project in which we investigate how research on patient experience can inform hospital design. In this paper, we explore more specifically (1) how insight into patient experience can foster an empathic and motivated understanding amongst healthcare professionals and designers, (2) what kind of information is needed to achieve this, and (3) how their improved understanding impacts on their problem solving ability. After sketching the background of the overarching project, we explain the approach adopted in the case study. Subsequently, we present insights in reply to the questions above. We then discuss to what extent the approach was successful and what lessons can be learned about informing hospital staff and designers on patients' experience. We conclude that a discrepancy exists between what research can tell about real patients' experience, what healthcare professionals expect to learn, and what is useful for designers to work with.

Background

Various studies show that the environment – products, services, and spaces – has a significant impact on patients' wellbeing and as such can add to their healing process (Ulrich et al., 2008; Huisman et al., 2012; Desmet & Pohlmeyer, 2013). Most designers and hospital staff are convinced of this impact but often lack accessible information offering a nuanced insight into patients' experiences. Ideally this information is obtained through interaction with real users, allowing the designer to develop a more thorough understanding of and empathy with them (McGinley & Dong, 2011). However, since time and money restrictions in a typical design process often result in a minimal user engagement (Cassim, 2010), designers are often unable to obtain this direct input from users and become dependent upon indirect sources of human information (McGinley & Dong, 2011).

As designers often do not have direct contact with the people they are designing for, various techniques have been developed to bring them closer to these people's experience (Kouprie & Visser, 2009; McGinley & Dong, 2011; van Rijn et al., 2011). These techniques vary from having direct contact with real people, over consulting videotaped observations or interviews, to being presented with profiles of imaginary persons. Most of these techniques aim to foster empathy. In the case of vulnerable groups like hospital patients, practical and ethical restrictions make it hard for designers to actually engage with them.

Experiential user information like ethnographic data collected in various (health)care settings, both hospitals and (residential) care facilities, could provide hospital staff and designers with much of the needed information to gain insight into patients and residents' experience and to empathize with them. Yet the scientific articles this research is mostly presented in, are not the number one source where designers look for information (Annemans et al., 2014). Possible explanations are that designers are rather motivated by visual communication and like information to be presented graphically (Lofthouse, 2006) or that they often feel mistrust towards data that have already been interpreted (Restrepo, 2004). They claim to prefer raw data in a format that is condensed down to be design-relevant (McGinley & Dong, 2011). On the other hand, architects are often inspired by other architectural projects, whether consciously or not (Heylighen & Neuckermans, 2002).

Approach

Context

The case study reported on here took place in a general Belgian hospital. The hospital in its present form results from a fusion between two hospitals located at the opposite sides of a street. With the fusion the distance between both needed to be bridged, which was realised literally by building a covered bridge over the street to connect the two buildings. This, in combination with the organic growth of both buildings over time, created a hard-to-understand building layout, causing considerable wayfinding issues.

The current wayfinding system, overruling all previous ones, makes use of numbered streets, with numbers having no direct relationship with floors or corridors. Scattered around the buildings are traces of former systems, like coloured corridor crossings. Although the numbered street system is theoretically well thought through, it is not always experienced as such by patients and visitors who are unfamiliar with the building, and are often in an anxious or nervous state of mind.

To prevent mistakes, reception staff are only allowed to give the route number and an explanation on how to follow the arrows. Other staff often have a limited understanding of the numbered routes, as they still think about the hospital in terms of its former numbering with letters for different buildings and floor numbers in each building.

Study Design

The presented case study is part of a broader case study enquiry. A case study is defined as the study of a case (person, place, event), selected for its particularity, and 'bounded' by physical, temporal, social/cultural, and conceptual features. Case studies are the preferred strategy to gain an in- depth understanding of a contemporary phenomenon in a real-world context (Yin, 2012; Flyvbjerg, 2006). In this case we studied a fusion hospital confronted with a particular wayfinding issue and aiming to obtain an in-depth understanding of the problem as well as to take steps towards formulating possible strategies to tackle the problems the hospital is facing.

The case study we report on consists of three workshop sessions in the hospital with a variety of staff members. Each session took half a day and session 2 and 3 were organised in one day.

Session 1: Identifying problems

The first session focused on identifying problems with regard to wayfinding from a patient perspective.

After participants expressed their personal issues with (the) wayfinding (system), their attention was shifted towards the patient perspective. To this end, we loosely applied the persona's technique often used in product- and service design (Pruitt & Grudin, 2003; Nielsen, 2013). This technique allows designers to base their decisions on fictional people's goals and activity scenarios, thus taking into account a broader user groups than only those similar to themselves (Pruitt & Grudin, 2003). The workshop started with a group session to identify an example of a patient visiting the hospital, then partici-

pants were divided in small team and each team was challenged to create its own patient profile. Most important was the person behind the patient: pathologies or reasons for a hospital visit were taken in consideration only after a person profile was created. To diversify the routes through the hospital each group could pick a card with information on why this person visited the hospital.

To foster their empathy with patients and thus improve their insight into their wayfinding experience, participants were asked to follow the assigned route through the hospital, trying to perceive it from the perspective of the person they had created and to document it through pictures. At the end of the session each team was asked to present their route and to identify problems they encountered with regard to wayfinding.

Session 2: Offering insight into wayfinding based on experiential user information

In the second session participants were offered experiential patient information through a website. The website encloses a combination of theoretical knowledge and insights into (the experience of) wayfinding (fig. 1). This is achieved by connecting data fragments from qualitative research on patients' wayfinding experience with theoretical concepts on wayfinding.

The homepage of the website gives a short introduction on wayfinding. This theoretical part shows the reader that wayfinding is about more than just signage. Also architecture and communication play an important role in guiding patients to their destination. From the homepage the reader is directed towards four profiles of patients navigating a hospital. Each of these profiles is documented by video-recordings of the patient's route through the hospital and quotes from interviews with the patient. When relevant, the profiles are complemented with similar insights from other patients.

During the first part of the session participants were given the opportunity to explore the website. Thereafter, they were asked to pick at least three pictures they had made in the first session and to re-evaluate them based on the new insights they gained from the concepts and experiential information offered through the platform.

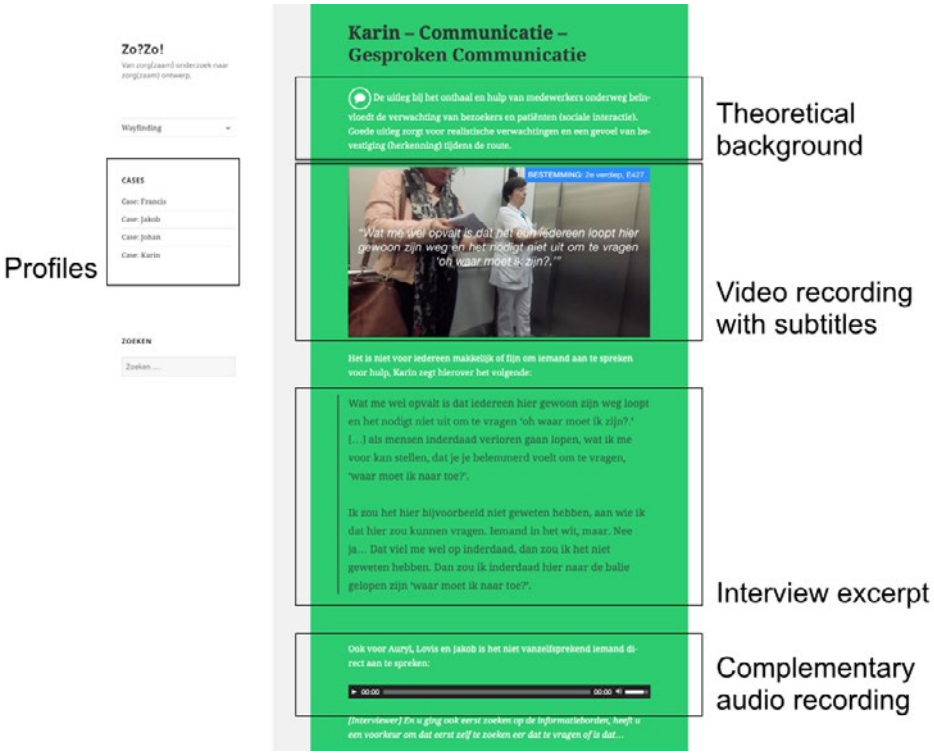

Figure 1. Example of a profile on the website.

The assignment was structured following a step-by-step approach:

1. Identifying bottlenecks
2. Analysing bottlenecks through the application of theoretical concepts
3. Weighing possible solution strategies against one another

By following these steps, certain locations where multiple concepts were relevant were identified. (Spatial) elements from which a wayfinding issue originated or which could serve as a trigger to improve the situation were then documented.

Session 3: Generating solutions

The third session was solution oriented. Based on the insights gained by the analyses made in the previous sessions, participants, in dialogue with the researchers, now explored possible solutions to the wayfinding problems that suit the concrete context of the hospital.

Participants

Workshop participants were recruited by the hospital in consultation with the researchers. We aimed at a broad variety of staff profiles dealing with wayfinding or the wayfinding system from various angles. The first session was attended by nine persons:

– facility manager
– head of the building department
– employee of the building department
– employee of the prevention service
– patient administration processes manager
– employee patient administration processes (= reception staff)
– employee patient transport
– employee logistics
– security staff

For the second and third session this group was complemented with two additional persons:

– reception volunteer
– nurse.

Although all participants work in the same organisation, this variety of people had never before met to discuss the working of the hospital on an equal footing.

Data collection and analysis

The three sessions were led by two researchers (author 1 and 2) who alternated in leading the discussion and observing. All group discussions were audio-recorded. When participants were working in teams the researchers provided support and observed group dynamics and registered conversations. The pictures taken by the participants in the first session were collected and used both to analyse the outcome of the first session and to serve as a starting point for the second session.

The analysis started right after each session with a first discussion between the researchers about the issues at stake regarding (1) the desired and used content in relation to the format in which it was offered or generated, and (2) the approach of the workshop. Observations and evaluations were noted down and taken into account for the next session.

Findings

This section discusses the workshop findings on the basis of the questions outlined above: (1) how insight into patient experience can create an empathic and motivated understanding amongst healthcare professionals and designers, (2) what kind of information is needed to achieve this, and (3) how their improved understanding impacts on their problem solving ability.

Fostering an empathic, motivated understanding

Wayfinding is clearly a key issue in the hospital which most of the participants are confronted with on a daily basis. Not only does staff's experience differ significantly from patients', participants each had their own vision on the current wayfinding system and according communication. The origin of the divergent view on wayfinding can be found in how the building is approached by staff and how this differs from how patients are expected to make use of the wayfinding system. Staff are often familiar with multiple parts of the hospital, which offers them an overview, whereas patients and visitors have a more fragmented experience as they come in contact with only parts of the hospital. Moreover, most staff members still think about the hospital in terms of the former system of buildings and building blocks, and not in terms of the present routing system. This leaves them often unable to support patients in following the routing system.
Staff members' sensitivity towards the patient perspective differed depending on their professional profile. Especially those who designed and implemented the current routing system had difficulties understanding why wayfinding was so problematic for patients and visitors. Given their overall understanding of both the building and the system, they clearly saw the coherence and logic, and were unable to zoom in on patients' more fragmentary experience of the building. This resulted in a mistrust towards patients' ability to navigate the building. Frequently heard comments include "*People don't take the time to understand the logic behind the system*" and "*I don't know whether you help patients by saying the floor [they have to be on], because then they surely take the wrong elevator*". Reception staff were very well aware of the troubles patients were facing, being unable to read the ranges of numbers and feeling lost when they could not immediately spot the next sign. For them the enforced communication style, telling them not to give more information than the route number, caused considerable frustration.

When participants were asked to create a patient profile from whose perspective they would explore the building, all four groups opted for a vulnerable person. Three teams created a refugee (probably due to moment of the case study, at the height of the refugee crisis in Europe), unable to speak the language and completely unfamiliar with the building and common procedures. The fourth team opted for a confused older man. By following the route these people would take when dealing with the health problems according to the corresponding scenarios, participants were confronted with issues they had formerly not considered:

– Patients are highly dependent on staff to get started with the routing system especially when not following a standardized path, *i.e.* entering via the emergency department or having missed a bus stop and approaching the building from a different street.

– The current wayfinding system is designed from the perspective of a standard patient; one flaw -not understanding the language, not using the lift because of claustrophobia, or just being too stressed to listen to the instructions- can result in getting lost.

By navigating the building from a patient's perspective, participants experienced the flaws in the routing system first-hand. The current wayfinding approach strictly aims at guiding people to their destination completely based on signage, without supporting them in understanding where they go. Once you miss a sign or lose track of the numbers, there is no other option than returning to where you came from. This is reflected by the pictures participants took while following patients' routes. A majority only showed signs and arrows, picturing nothing more than the ceiling and the upper part of the walls (figure 2). Architectural elements were hardly ever recorded. Only when looking at the pictures participants realised their limited focus. The few images showing people and views of the environment were taken when they had lost track of the signage. Participants stressed that at these moments they particularly appreciated encountering (personal) support and orientating elements.

Figure 2. Sequence of 9 consecutive pictures taken by participants only showing signs.

Concentrating on the upper part of the hallways limited the opportunity for participants to actively use the built environment as support in navigating the building. Exploring the website helped participants realize that orientation is an important element in wayfinding. The website offered a whole section on how the built environment could support orientation, based on both theoretical concepts and visual material showing how people navigated another hospital.

Types of information and techniques

The technique offered in the first workshop to create patient profiles, supported participants to think about the particularities of those experiencing wayfinding problems. It seemed an excellent preparation for empathizing with vulnerable hospital users and actually being open to perceive the building from their perspective. This change of mind-set –moving from being oc-

cupied with their own view on, and frustrations with the wayfinding problems– appeared to be a necessary step to be able to evaluate the building from a patient perspective.

The website offered various types of information, each holding its own value to sensitize and motivate participants to obtain a better understanding of patients' wayfinding experience. The introduction page explained certain theoretical concepts which were then further developed on the next pages showing real patients dealing with wayfinding in a hospital. Links between the patients' experiences were also made based on these concepts.

When asked about the most relevant information type, participants pointed at the video material. Especially appreciated were side-by-side videos of a hallway respectively with and without people, complemented with an explanation of how this was experienced differently by patients. Participants claimed that the theoretical framework was not that appealing and added little to motivate them or enhance their empathetic understanding of wayfinding. Yet, in the following discussion and search for solutions, they often used the concepts offered through the theory. Although not valued explicitly, offering these concepts apparently seemed to provide the workshop participants with a common vocabulary to discuss certain issues that appeared during their exploration of the building and/or while watching the patients' video's or reading their testimonies.

Understanding patients' experience and empathizing with it is one thing, formulating solutions to improve the situation is another. Connecting the offered theoretical concepts with concrete locations in the hospital was not sufficient to actually be able to formulate clear cut solutions. When asked what would support them in coming up with these solutions, above all participants suggested examples of best practices.

Impact on problem solving ability

Generating solutions was not a natural next step after the evaluation of the hospital building and its wayfinding system. Especially considering the familiar environment with an open mind appeared to be challenging. The current system was strongly defended and change encountered serious opposition by the employees of the building department. Yet, making use of the self-created patient profiles seemed to be an eye opener. References to the wayfinding experience from these patients' perspective and the pictures taken along their route were made: "*I think there are pictures of the place where people go to [destination X] that's indeed a very difficult point, we saw that."* Also the experiential information on wayfinding experience in a different hospital was used to think about possible solutions. Participants referred for example to the use of a map to provide patients with something to hold on to and help reach their destination.

Before the workshop, participants each reflected on wayfinding from their own perspective and did not seem to connect these perspectives to create a mutual understanding. The shared vocabulary offered through the theoretical part of the website and appropriated through the assignments appeared to be an important basis to start a dialogue. Whereas the strict instructions on how to communicate on the routing was a thorn in the side of the reception staff, for those who designed and implemented the system it was unthinkable to change it. Offering the participants insight into how signage, architecture and communication work together to mediate patients' wayfinding experience in combination with a better understanding of the diversity of patient perspectives, seemed to open their minds to rethink one-sided assumptions

and see the value of extra interventions that may not exactly fit in with a wayfinding system based on numbered streets only.

Only during the discussion, guided by the researchers, participants seemed to be able to connect the different types of information offered through the website. At this point they combined theoretical concepts with the experience of following the patient scenario's. This resulted in the creation of a "spine" through the hospital, i.e. the route from the entrance of one building to that of the other building. The spine should not be used to actually follow the entire route but could function as a point of recognition to return to and depart from again. Also certain intersections and vertical circulation could benefit from being more explicated.

Reflecting on the three workshops, participants concluded that when consciously designed, signage and more implicit spatial interventions can complement and strengthen each other. Creating an integrated approach which combines architecture that directs people while moving through the building with a communication strategy that supports patients and visitors throughout their journey holds potential to enhance rather than endanger the functional system that is now in use.

Discussion

Despite staff's good intentions to be helpful and supportive towards patients and visitors, many of them did not realise how far their use, understanding, and experience of the hospital building diverted from patients'. As some of the participants often come in close contact with patients and visitors experiencing wayfinding problems, think of reception staff or volunteers, this group could express some of patients' grief. Yet, none of them actually had ever followed these people's routes. Additionally, they were confronted with regulations imposed on them regarding what they could tell patients and visitors and how far they could go in offering support. Whereas these communication guidelines were formulated with the best intentions with regard to the efficiency of the wayfinding system, i.e. only following the signs, there was no common understanding on why and how this conflicted with patients' and visitors' intuitive approach to and experience of navigating the building.

Fostering empathy with patients by making staff walk in their shoes, created a first impression of patients' perspective amongst the participants. They noticed how dependent they were on staff members' willingness to put them back on track once lost. The (lack of) communication in various forms, be it spoken, written, or through the building, even left them in despair regardless of their familiarity with the environment. The pictures they took of the followed route, only showing signs, ceiling and the upper part of the walls, pointed at the dependence on signage, and the lack of attention to additional (building) elements that could support orientation and navigation. Being unable to literally open doors they would normally use, provided them with a whole new perspective on the (lack of) coherence of the built environment. Obtaining this embodied understanding seemed to motivate the group to further collaborate on solving the issue, uniting each member's previous personal concerns and perspective on patients' and visitors' experience.

In obtaining a better understanding of the wayfinding problems in the hospital, participants felt especially supported by the video-recordings offered through the website in the second session. In the third session, they frequently referred to them connecting concrete situations from the videos with their own experience. An important advantage of the video's (combined with a textual explanation) seems the opportunity to offer nuanced insights in a compact way. Still, when asked to analyse the pictures taken in the first session by connecting them to theoretical concepts offered through the website, participants seemed to hesitate. Only consulting the website was not considered sufficient to analyse and identify bottlenecks in the hospital's spatial organisation. To achieve this participants demanded very concrete, and guided tasks.

The combination of embodied experience with fostering empathy seemed to convince participants of the added value of integrating architecture, communication, and signage to improve wayfinding. The presented information, combining theoretical concepts with visual material and narratives on patients' and visitors' wayfinding experience, raised their awareness of the problems patients were facing and helped them to analyse the existing situation, but did not seem to support them in finding solutions. To this end, participants suggested providing best practices, i.e. examples of good solutions. This is in line with the outcome of previous research pointing at architects' case based design approach (Heylighen & Neuckermans, 2002). Apart from the fact that providing this type of information lay beyond the scope of the project, we are concerned that showing these examples could also hamper participants' out of the box thinking.

Conclusion

The case study shows how, apart from providing experiential patient information, guidance and initiative by an external moderator provides an added value to exploring the experiential by themselves. Although all participants were working within the same organization, it took a third party to bring them together to collectively discuss a common topic. Doing so turned out to be an enrichment for all parties involved. This value was confirmed by the participants as they planned to continue collective meetings to discuss this and other topics concerning the hospital's (spatial) organization.

Depending on their profile, participants had different expectations of the format and content of the information presented during the workshop. For some empathizing with patients was truly eye-opening, for others just a confirmation of what they dealt with on daily basis. Letting go of the strict signage approach and according communication was for some a relief, for others a heavy duty. Starting from a shared understanding of the issues at stake, generated through the session to foster empathy and the video-recordings and supported by a common language provided through the theoretical concepts, created a basis for collaboration between staff members with distinct profiles.

Although the workshop was generally evaluated positively, specific attention should be paid to raising realistic expectations about information on patient experience. What research can offer, what hospital staff expect, and what is most fruitful to support design does not always coincide. Particularly in the case study presented here, we found a discrepancy between what research can tell us about real patients' experience, what healthcare professionals expect to learn, and what is useful for designers to work with. In the overarching project the insights gained through this case study will be combined with those from others to add to our understanding of how research on patient experience can inform hospital design.

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